

A new species of *Melomys* (Rodentia, Muridae) from Yamdena Island, Tanimbar group, Eastern Indonesia

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Abstract — Seven specimens of *Melomys*, superficially most similar morphologically to members of the *M. leucogaster* group (*sensu*, Tate 1951), were recently collected in Yamdena Island, eastern Indonesia. They are herein described as a new species.

INTRODUCTION

In April–May 1993, a team of vertebrate biologists from the Western Australian Museum and the Museum Zoologicum Bogoriense, collected seven specimens of *Melomys* from Yamdena Island, Tanimbar group, Maluku Tenggara. The combination of medium to large size (body and pes lengths greater than 120 mm and 25 mm, respectively), a short, broad skull, short rostrum, fur on ventral surface white to base and only one hair for each tail scale, identify these specimens as belonging to the *Melomys leucogaster* – *M. rufescens* group (Rümmmler 1938, Tate 1951). These Tanimbar specimens are herein described as a new species.

METHODS

The Tanimbar specimens were weighed in the field prior to their fixation with formalin. External measurements were recorded from these specimens following their fixation, except for the skin and skull WAM M43821, which was measured prior to fixation. All measurements (in mm) were taken with digital callipers: externals to 0.1 mm; skull and dental to 0.01 mm. Measurement points follow Tate (1951). Pelage and colour descriptions, where they were determined from the colour charts of Smithe (1975), are capitalised.

Adult condition was judged by reproductive status only, because basicranial sutures were still clearly visible in specimens of Tanimbar *Melomys* that were reproductively mature and had very worn teeth.

THE *MELOMYS LEUCOGASTER* – *M. RUFESCENS* “GROUP”

Rümmmler (1938) placed the following forms as subspecies of *M. leucogaster*: *M. l. leucogaster* (Jentink, 1908) (including *M. latipes* Tate and Archbold, 1935); *M. l. arcium* (Thomas, 1913); *M. l. fulgens* (Thomas, 1920); *M. l. talaudium* (Thomas, 1921) and *M. l. caurinus* (Thomas, 1921).

Tate (1951) considered *M. arcium*, *M. fulgens*, *M. caurinus* and *M. talaudium* to be species. He retained *M. latipes* and *M. rubicola* Thomas, 1924 as subspecies of *M. leucogaster* but stated that “I am almost of the opinion that they should be reduced to synonyms of *M. leucogaster*”. Laurie and Hill (1954) considered that *M. leucogaster* comprised only *leucogaster* and *latipes*. They considered *rubicola* a species and listed *talaudium* and *caurinus* as subspecies of *M. fulgens*.

Rümmmler (1938) considered that *M. rufescens* comprised three subspecies: *M. r. rufescens* (Alston, 1877); *M. r. gracilis* (Thomas, 1906) and *M. dollmani* Rümmmler, 1935. Tate (1951) added the following subspecies: *M. r. bougainville* Troughton, 1936; *M. r. stalker* (Thomas, 1904); *M. r. sexplicatus* (Jentink, 1907); *M. r. hageni* Troughton, 1937; *M. r. niviventer* Tate, 1951 and *M. r. calidior* (Thomas, 1911). He placed *Mus musavora* Ramsay, 1877 in synonymy with *M. r. rufescens*. Laurie and Hill (1954) largely followed Tate (1951) but placed *dollmani* in synonymy with *gracilis*.

TAXONOMY

Melomys cooperae Kitchener sp. nov.

Figures 1–3, Table 1

Holotype

Museum Zoologicum Bogoriense specimen number 15902; adult (pregnant) female; weight 65 g; carcass fixed in 10% formalin and preserved in 70% ethanol; skull separate; liver preserved at the Western Australian Museum in ultrafreeze refrigerator. Collected in breakback trap on 2 May 1993 by R.A. How and D.J. Kitchener.

Type locality

1 km S Kebun Lorulun, c. 20 km N Saumlaki, Yamdena Island, Tanimbar group; Maluku Tenggara, Indonesia (7°52'S, 131°25'E); altitude 200 m.

Paratypes

All collected at Lorulun; all alcoholic specimens, except Western Australian Museum No. (WAM) M43821, which is a skull and cabinet skin; all adult, except WAM M43823 which is a subadult.

WAM (M43621–22, M43821), 4 ♀ ♀; WAM (M43746, M43820, M43823) 3 ♂ ♂.

Diagnosis

Melomys cooperae is diagnosed from all other species of *Melomys* by its large last upper molar (M³) and combination of very long tail, long incisive foramen and distinctive white cheeks.

Description

Measurements of skull, dentition and externals are presented in Table 1.

Skull (Figure 1)

Skull of moderate size: greatest skull length 36.7 (36.0–38.0) and zygomatic width 18.2 (17.2–18.9), with a relatively narrow and short rostrum. Skull dorsal profile gently curved from nasal distal tip to parietal mid point when it curves more sharply downward to external occipital crest; interparietal wide 9.8 (9.1–10.5); parietal moderately inflated; frontal posterior part very slightly inflated but anteriorly forms a slight median sulcus that reaches

Table 1 Measurements (in mm) of the skull, dentition, and externals and weight (g) of *Melomys cooperae* sp. nov. holotype and paratypes and *M. leucogaster latipes*.

CHARACTER	<i>M.l. latipes</i> <i>M.l. latipes</i>								
	Museum number	Holotype MZB15902	WAM 43621	WAM 43622	WAM* 43821	WAM 43746	WAM 43820	WAM 43823	* AM13781
Age/Sex	A ♀	A ♀	A ♀	A ♀	A ♂	A ♂	SA ♂	A ♀	A ♂
Greatest skull length	36.20	–	–	36.48	36.03	38.02	34.83	–	36.99
Condylolincisor length	32.95	33.86	–	33.97	32.84	35.04	31.29	–	36.83
Zygomatic width	18.31	18.49	17.17	18.72	17.91	18.86	17.23	–	21.17
Interorbital breadth	5.66	5.81	5.68	5.98	5.70	5.61	5.29	6.79	6.73
Interparietal breadth	10.51	9.11	–	9.63	9.99	9.85	10.01	–	10.43
Braincase breadth	14.87	14.78	15.27	15.02	14.97	14.74	14.86	15.21	15.55
Mastoid width	12.57	12.43	–	12.81	12.83	13.06	12.42	–	14.38
Nasal length	12.80	–	11.35	11.82	11.87	13.08	12.31	11.65	11.58
Nasal breadth	4.31	4.50	3.97	4.77	4.28	4.59	4.60	4.23	4.15
Zygomatic plate breadth	4.76	4.83	4.27	5.22	4.85	5.08	4.71	4.79	5.28
Diastema length	8.68	9.67	8.93	10.10	9.07	10.06	8.88	10.62	11.12
Height muzzle (behind ant. pal. for.)	9.53	9.41	8.72	9.27	9.01	9.34	8.67	9.73	9.74
Palatal length	17.28	18.02	17.24	18.36	17.64	18.81	16.92	19.04	19.60
Ant. palatal foramen length	4.70	5.98	5.53	5.74	5.58	6.18	5.12	5.29	5.44
Ant. palatal foramen breadth	2.29	2.26	2.17	2.28	2.46	2.29	2.26	2.44	2.76
Mesopterygoid fossa breadth	3.06	2.93	2.60	3.10	2.98	3.09	3.15	3.14	3.20
M ¹ –M ¹ breadth (inside)	2.99	3.24	2.84	3.42	3.03	3.34	2.89	3.46	3.91
Bulla length	5.06	5.34	–	5.52	5.05	5.17	4.97	4.92	4.69
M ¹ –M ³ crown length	6.87	6.82	6.46	6.31	6.73	6.58	6.52	6.86	6.72
M ¹ –M ³ alveoli length	7.08	7.10	6.61	6.64	7.00	6.99	6.68	7.04	6.95
M ¹ crown length	3.79	3.33	3.69	3.42	3.57	3.25	3.58	3.65	3.35
M ¹ crown breadth	2.00	2.02	1.84	2.01	2.02	1.84	2.12	2.13	2.01
M ² crown length	2.53	2.40	2.17	2.55	2.51	2.50	2.50	2.79	2.57
M ² crown breadth	1.94	2.02	2.01	1.99	2.03	1.80	2.04	2.10	1.99
M ³ crown length	1.39	1.64	1.61	1.50	1.52	1.60	1.53	1.57	1.78
M ³ crown breadth	1.44	1.42	1.44	1.46	1.38	1.37	1.41	1.52	1.43
Dentary length	21.42	20.73	19.16	20.59	20.17	21.46	19.60	22.64	23.91
M ₁ M ₂ (crown) length	7.02	6.69	6.46	6.54	6.49	6.46	6.53	7.28	6.84
Snout to vent length	128.0	135.7	118.1	137.0+	131.6	139.5	112.7	150.0*	160.0*
Tail to vent length	154.5	170.0	139.7	155.0+	142.0	158.4	140.5	151.0*	–
Ear length (from basal notch)	17.2	18.4	16.9	18.5+	16.3	19.7	16.6	17.0*	15.9*
Pes length (without claw)	27.0	25.8	24.8	25.3+	27.7	28.1	26.8	29.7*	31.0*
Pes breadth at base of digit V	8.2	7.7	7.4	5.6+	7.8	8.4	7.6	7.3	7.7
Tibia length	34.4	37.3	33.5	–	36.5	40.1	34.0	–	–
Weight (gm)	65.0	81.0	64.5	72.0	80.0	96.5	60.0	122*	146*
Scale No./cm	12	12	14	–	12.5	11.5	14	–	–

* Skin and skull

+ From recently killed animal

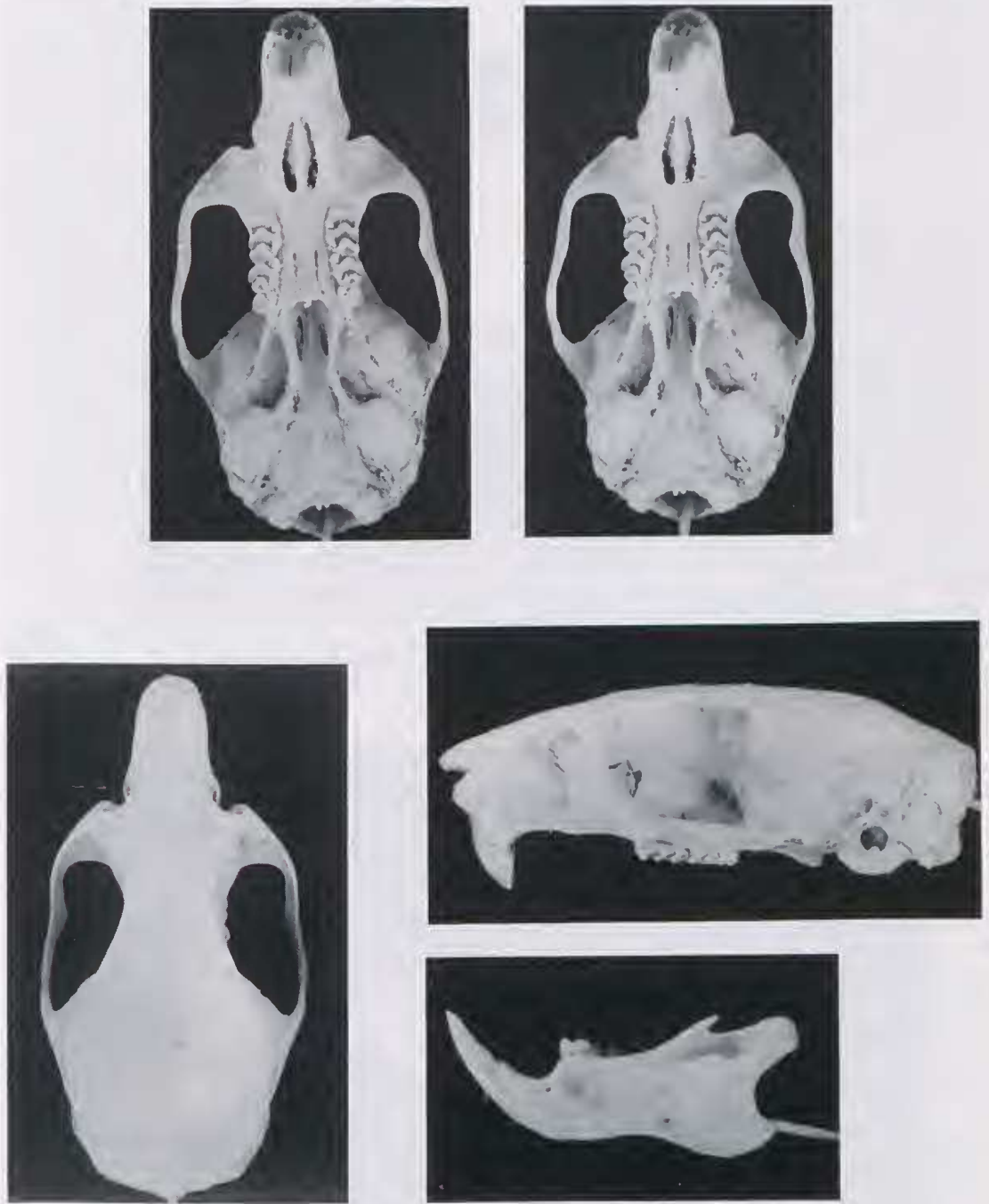


Figure 1 Plates of dorsal, ventral (as stereopairs) of the skull and lateral surface of the skull and dentary of holotype of *Melomys cooperae* sp. nov., holotype.



Figure 2 Plate of the tail and of the pes plantar surface of *Melomys cooperae* sp. nov., holotype.

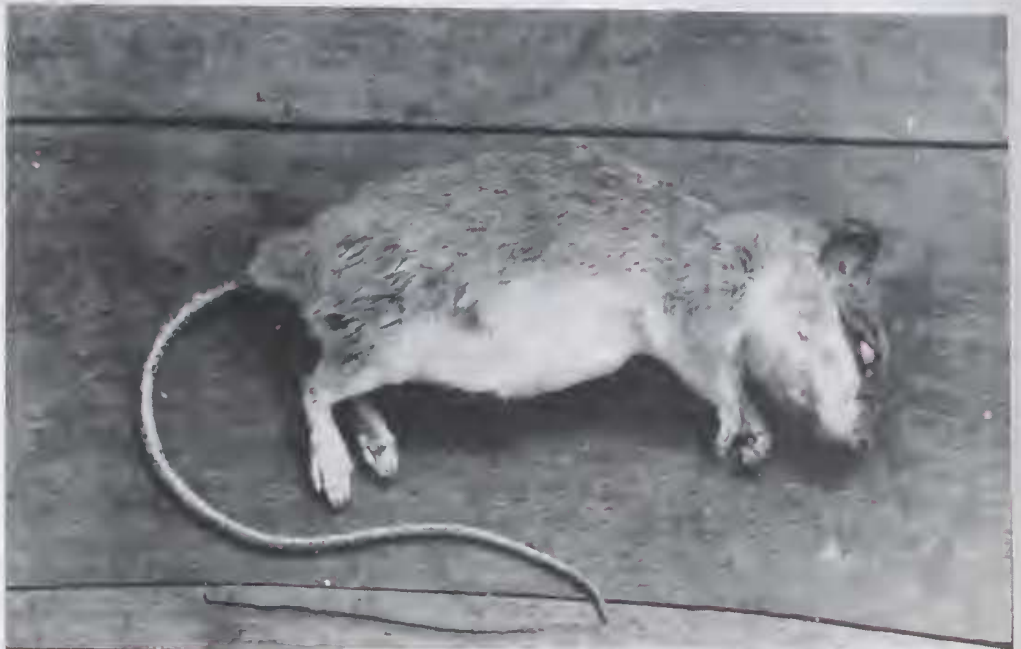


Figure 3 Photograph of *Melomys cooperae* sp. nov. taken shortly after its death. (Photograph by Dr R.A. How).

to posterior one-quarter of nasal; nasal short 12.2 (11.4–13.1), sharply constricted proximally and flared to a breadth of 4.4 (4.0–4.8) distally; anterior edge of premaxilla flange projected dorsally above incisor, almost vertical, or slightly convex leading edge – nasal projects to a point approximately above or slightly anterior to this leading edge; zygomatic arch moderately thickened with the ventral part of malar process broadest; zygomatic plate broad 4.8 (4.3–5.2), anterior leading edge almost vertical; infraorbital fissure moderately wide; lachrymal bones moderate, project only slightly outside the anterointernal curve of the orbit edge; post-squamal hook moderately well developed (the holotype has a noticeable proximal dorsal projection), forms a slight vertical ridge with lateral occipital and mastoid, this ridge does not progress to interparietal posterior margin; postglenoid foramen small, semioval; temporal ridges slight, from frontal/parietal suture a fainter beading traverses dorsolateral margin of parietal to interparietal; rostrum narrow with posterolateral swelling only slightly inflated; anterior palatal foramen vary in length (4.7–6.2) but terminate posteriorly well anterior of M^1 anterior alveolus, broadly bowed but slightly wider posteriorly; palate narrow with upper tooth rows diverging posteriorly; mesopterygoid and parapterygoid fossae narrow; foramen oval ventral fossa small; bulla long 5.2 (5.1–5.5), moderately inflated, with long and robust eustachian process; internal pterygoid process diverge posteriorly, terminate anterior to eustachian process.

Dentition (Figure 1)

Molars large, M^3 larger than all other species of *Melomys* (cf Menzies 1991: Fig 3), particularly anterolingual cusp; M^1 anterior and intermediate lamellae with well developed lingual cusps; posterior lamella without lingual cusp but with lingual and buccal posterior extensions which enclose a distinct, centrally-placed fossa (on moderately worn teeth, this is evident as an isolated enamel ring entirely within the posterior lamella); M^2 with large anterolingual cusp only remaining of anterior lamella, intermediate and posterior lamellae well developed. The latter with posterior fossa as on M^1 . M^3 with anterolingual cusp well developed, separate from posterior lamella; molar rows diverge posteriorly from each other; upper incisors opisthodont, anterior face orange. First and second lower molars each with well-developed posterior cingulum; M_1 with small but distinct anterior moiety, soon merging with intermediate lamella as result of wear.

Externals (Figures 2 and 3)

Moderate body size with snout to vent length

132 (118–140) 6 and weight 76.5 (64.5–96.5) g. Tail long 153 (140–170) 6 and averaging 116% of body length; ears long 17.8 (16.3–19.7) 6; pes moderately long 26.5 (24.8–28.1) 6, narrower than *M. leucogaster latipes*. Scales on tail not raised to form a ridge or hump (Figure 2). Plantar pads of pes and manus typical of *M. l. leucogaster*, *M. l. latipes* and *M. rufescens* from Aru Islands. There are two pairs of inguinal teats.

Pelage

Dominant colour of dorsal surface pelage Cinnamon Brown resulting from Cinnamon Brown and/or Black tipping to the Medium Neutral Gray colour of basal three-quarters of hairs. Head contrastingly coloured. Black tipping more prominent on rostrum and forehead evenly grading into Cinnamon Brown of temporal region, but contrasting with White of cheeks – dark rings around eyes further highlights this contrast. Hairs in mid dorsum with length of 9 while those of mid forehead 7; flanks Cinnamon tipping to the Medium Neutral Gray of basal two-thirds of hairs. Lips, cheek to just beneath eye, throat, chest, abdomen to anus, inside of thigh, manus and pes upper surface White; interface between White of abdomen and Cinnamon of flanks Medium Neutral Gray as Cinnamon tipping of hairs becomes more sparse. Abdomen hairs 5–6 long; outer leg surface Cinnamon. Proximal two-thirds of ear pinna skin Cinnamon, distal one-third Dark Neutral Gray; pinna lightly furred inside and outside with short Cinnamon Brown hairs. Tail skin Gray Lavender dorsally and a paler Pale Neutral Gray ventrally.

Tail scales with one hair per scale; tail hairs moderately long, three-quarters scale breadth.

Habitat

Six of the specimens, including the holotype, were captured in breakback traps set on the ground in open (15–30% canopy cover), tall (to 30 m), disturbed vine forest (Figure 4) with the following genera of trees prominent: *Ficus*, *Erythrina*, *Podocarpus*, *Albizia* as well as 'Kenari' trees. The understorey was mostly *Lantana*. There were numerous vines and creepers (Figure 4). The western edge of the trapping site had a small stream with the freshwater mangrove *Barringtonia* (fidé R.E. Johnstone).

One specimen (M43746, adult male) was trapped in a breakback trap in a pure association of Alang Alang grass (*Imperata cylindrica*) that adjoined the above described vine forest.

Reproduction

The two adult females collected on 18 April 1993 were pregnant. Both had two fetuses in the right uterine horn and none in the left horn. The crown



Figure 4 Photograph of the habitat at Lorulun, Yamdena Island – type locality of *Melomys cooperae* sp. nov. (Photograph by Dr R.A. How).

to rump lengths of one set of these foetuses was c. 14.5 and the other c. 19.2. Of the two females collected two weeks later on 2 May 1993, one had two near-term foetuses (crown to rump lengths 30.2 and 39.3), with one in each uterine horn; the other female appeared to have recently given birth because its uterine horns were large, incompletely involuted and extremely vascular along their internal margin (although no clear implantation sites were apparent). The two males collected on 2 May had scrotal testes with prominent epididymides. The male collected on 18 April (WAM M43823) was subadult and had small abdominal testes with dimensions of 4.1 x 6.5.

Distribution

Known only from the type locality, Lorulun, Yamdena Island.

Remarks

Melomys cooperae may be confused superficially with some of the forms which have been associated with *M. leucogaster*. A number of these forms are known from the type or a few specimens only, which we were not able to examine. We have, then, depended on the original type descriptions and measurements of most of these forms in Rümmler (1938), Tate (1951), Menzies and Dennis (1979), but made direct comparison with two reference specimens of *M. l. latipes* from Papua New Guinea. The measurements presented below are of adult

specimens only (mean, range, sample size).

Melomys cooperae differs from *M. l. leucogaster* in having a generally smaller body e.g., snout to vent (body) length 132 (118–140) 5 v. (154–195) 4; tail generally longer relative to its snout to vent length 1.18 (1.08–1.25) 6 v. 0.95 (0.81–1.11) 5; pes length shorter 26.5 (24.8–28.1) 5 v. 31–36 (4). Skull smaller: e.g., zygomatic width smaller 18.2 (17.2–18.8) 6 v. 21.4 (21.2–21.5) 2; interorbital breadth smaller 5.7 (5.6–6.0) 6 v. 6.7 (6.7–6.7) 2; nasals shorter 12.2 (11.4–13.1) 6 v. 13.9 (13.8–14.0) 2; palate shorter 17.9 (17.2–18.8) 6 v. 21.1 (21.2–21.2) 2; palatal breadth inside M^1 narrower 3.1 (2.9–3.4) 6 v. 3.7 (3.5–3.8) 2; bulla longer relative to palatal length 0.291 (0.275–0.301) 5 v. 0.238 (0.231–0.245) 2; M^{1-3} crown length shorter 6.6 (6.5–6.9) 6 v. 7.5 (7.1–7.8) 2.

It differs from *M. leucogaster latipes* in having a longer tail relative to its snout to vent (body) length 1.16 (1.08–1.25) 5 v. 1.02 (1.01–1.03) 2; pes length shorter 26.5 (24.8–28.1) 5 v. 30.9 (29.7–32.0) 3; pes and manus paler, predominantly white rather than a darker brown dorsally; cheeks white to edge of eye which is encircled by dark coloured ring rather than as in *latipes* where cheek colour same as forehead and without dark circles around eyes. Skull with rostrum longer and narrower, without marked inflations of posterolateral rostral bulbs such as occurs in *latipes*; nasal terminates distally approximately level with antermost face of premaxillary dorsal wing, rather than well

posterior to that face; skull narrower: e.g., interorbital breadth 5.7 (5.6–6.0) 6 v. 6.6 (6.3–6.8) 3; zygomatic width 18.2 (17.2–18.9) 6 v. 20.6 (20.0–21.2) 2 and braincase breadth 14.9 (14.7–15.3) 6 v. 15.4 (15.2–15.6); bulla longer 5.2 (5.1–5.3) 5 v. 4.9 (4.7–5.0) 3, considerably more inflated; ventral opening of foramen oval much smaller than in *latipes*; much more deeply incised sulcus running anterior of the sphenorbital fissure.

It differs from *M. rubicola* in having White cheeks, neck and back dark brown rather than strongly ochraceous; pes shorter 26.5 (24.8–28.1) 5 v. 31; tail shorter 153 (142–170) 6 v. 180; skull approximately same length but zygomatic width smaller 18.2 (17.2–18.9) 6 v. 19.

It differs from *M. arcium* in having White cheeks; tail longer rather than shorter than body length; tail longer 153 (142–170) 6 v. 127; skull smaller, e.g., condyloincisor length shorter 33.7 (32.8–35.0) 6 v. 38.1; zygomatic width narrower 18.2 (17.2–18.8) 6 v. 20.7; interorbital breadth narrower 5.7 (5.6–6.0) 6 v. 6.9; nasal shorter 12.2 (11.4–13.1) 5 v. 13.7; bulla larger 5.2 (5.1–5.5) 6 v. 4.7, longer relative to condyloincisor length 0.156 (0.148–0.163) 5 v. 0.123; M^{1-3} crown length smaller 6.6 (6.3–6.9) 6 v. 7.1.

It differs from *M. fulgens* in having dorsum dark brown and cheeks White rather than a vivid light orange brown (ochraceous) dorsum and no White cheeks; ears without whitish patch behind base; body length shorter 132 (118–140) 6 v. 150; tail shorter 153 (142–170) 6 v. 200; tail shorter relative to body length 1.16 (1.08–1.25) 5 v. 1.33; pes much shorter 26.5 (24.8–28.1) 5 v. 34; zygomatic width narrower 18.2 (17.2–18.9) 6 v. 22.2; interorbital breadth narrower 5.7 (5.6–6.0) 6 v. 7.0; palatal breadth narrower inside M^1 3.1 (2.8–3.4) 6 v. 3.8; palatal length shorter 17.9 (17.2–18.8) 6 v. 19.5; bulla longer relative to palatal length 0.291 (0.275–0.301) 5 v. 0.262; and M^{1-3} crown length shorter 6.6 (6.3–6.9) 6 v. 7.1.

It differs from *M. talaudium* in having one hair per tail scale rather than three; dorsum a dark brown and cheeks White rather than a vivid ochraceous dorsum and cheeks not White; body and tail length shorter, approximately as for *M. fulgens*; pes shorter 26.5 (24.8–28.1) 5 v. 30.5; zygomatic width narrower 18.2 (17.2–18.9) 6 v. 20.9; palate narrower inside M^1 3.1 (2.8–3.4) 6 v. 3.9; bulla much longer relative palatal length 0.291 (0.275–0.301) 5 v. 0.186; M^{1-3} crown length much shorter 6.6 (6.3–6.9) 6 v. 7.6.

It differs from *M. caurinus* in having dorsum a dark brown and cheeks White rather than dorsum orange brown (Tate 1951) and cheeks not White [although Rümmler (1938) described the pelage colour of the type as affected by immersion in alcohol]; tail much longer relative to body length 1.16 (1.08–1.25) 5 v. 0.8; scales on tail flat and not raised as round humps as in *caurinus*; ear much

longer 17.8 (16.3–19.7) 6 v. 10; pes shorter 26.5 (24.8–28.1) 5 v. 29.5; skull narrower, e.g., zygomatic width 18.2 (17.2–18.8) 6 v. 20.0; interorbital breadth 5.7 (5.6–6.0) 6 v. 6.4; palatal breadth inside M^1 3.1 (2.8–3.4) 6 v. 3.5; skull shorter, e.g., diastema length 9.4 (8.7–10.1) 6 v. 10.6; palatal length 17.9 (17.2–18.8) 6 v. 20.3; bulla longer 5.2–(5.1–5.5) 6 v. 4.8, also longer relative to palatal length 0.291 (0.275–0.301) 5 v. 0.237; and M^{1-3} crown length much shorter 6.6 (6.3–6.9) 6 v. 7.8.

The Tanimbar *Melomys* is difficult to confuse with *M. rufescens* from which it differs in having a dark brown dorsum and White cheeks rather than a generally brightly coloured Cinnamon dorsum (except for *M. r. stalkerii*) with no white cheek patches; tail with flat scales rather than scales with raised granules or humps; fewer tail scales per cm 12–14 v. 16–19; and molar row generally longer, >6.3 [only *M. r. rufescens* exceeds this but then only occasionally 6.1 (5.5–6.5) 25 (from Rümmler 1938)]. Comparison with a series of *M. rufescens* from the nearest population to Yamdena Island (Wokam Island, Aru group) indicates that *M. cooperae* also differs from this form by having a narrower rostrum; incisor more opisthodont; anterior palatal foramen larger; bulla longer and more inflated, least interorbital breadth larger; and temporal ridges less pronounced.

Etymology

Named after Mrs Norah Cooper in recognition of her work in the mammal section of the Western Australian Museum. In particular for her support and contribution to the Indonesian project between 1987–1993, where she participated in the Sumba Island expedition.

OTHER SPECIMENS EXAMINED

Melomys leucogaster latipes

Australian Museum No. (AM) M13781, A ♀, skin and skull, Naiya Village, E. side Mt Karimui, S. Simbu Province, Papua New Guinea; AM 13815, A ♂, skin and skull, 2.5 km SSW Yuro Village, E. side Mt Karimui, S. Simbu Province, Papua New Guinea.

Melomys rufescens

Western Australian Museum No. (WAM) M42626–7, M42637, M42446, M42450, M42566, 4 ♂ 2 ♀, Kampung Karangguli, Wokam Island, Aru Group., Indonesia.

ACKNOWLEDGEMENTS

We are grateful for the support of both Mr J.L. Bannister, Director of the Western Australian

Museum at the time of the expedition, now retired, the Director of the Museum Zoologicum Bogoriense, Bapak M. Amir and to the Indonesian Institute of Science (LIPI), particularly Dr Soetikno, who sponsored the field work.

Thanks also to our colleagues Dr Richard How and Mr Ron Johnstone, Western Australian Museum, for their support and good company in the field. Mrs Anne Nevin typed the manuscript. Dr Tim Flannery, Australian Museum, Sydney, and Dr Chris Smeenk, Natuurhistorisch Museum, Leiden, kindly loaned reference specimens.

Dr Ken Aplin, Western Australian Museum, and Dr J. Menzies, University of Papua New Guinea offered constructive advice to improve the description of the new species.

Expedition costs were defrayed by grants to Dr D. Kitchener from: National Geographic Society, Washington and the Australian National Parks and Wildlife Service, Canberra and to Drs L. Schmitt, D. Kitchener and R. How from the Australian Research Council, Canberra. Garuda Indonesia kindly defrayed freight costs of the expeditions.

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Manuscript received 14 November 1993; accepted 5 May 1994.